

REMARKS

Claims 1-28 are pending in the present application. In the Office Action mailed May 16, 2007, the Examiner rejected claims 7 and 25-27 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. The Examiner next rejected claims 3, 21 and 25 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claims 1, 11, 12, and 16 are rejected under 35 U.S.C. §102(b) as being anticipated by Ma (USP 6,016,057). Claim 28 is rejected under 35 U.S.C. §102(b) as being anticipated by Kassai et al. (US Pub. 2002/0188190). Claims 2-10, 13, 15, and 17-26 are rejected under 35 U.S.C. §103(a) as being unpatentable over Ma as applied to claim 1, in view of Haacke et al. (Magnetic Resonance Imaging, Haacke, E., et al., John Wiley and Sons, 1999). Claim 14 is rejected under 35 U.S.C. §103(a) as being unpatentable over Ma as applied to claim 1, in view of Bellemann et al. (Drug-Specific F19 NMR and Dynamic F-18 PET Imaging of the Cytostatic Agent 5-Fluorouracil, Bellemann, M.E., et al., IEEE Transactions on Nuclear Science, Volume 41, No. 6, December, 1994).

The Specification is objected to by the Examiner. Applicant has amended paragraphs 7, 32, and 35 per the Examiner's suggestion. However, Applicant does not agree with the Examiner that the Examiner's changes to paragraph 39 are informalities that need addressing. Applicant believes that the language cited by the Examiner is correct in its original form. Accordingly, Applicant requests withdrawal of the objection to the Specification.

The Drawings are objected to by the Examiner. A drawing replacement sheet is being concurrently filed changing the reference numeral "76" on the right-hand side of the figure to "80" per the Examiner's suggestion. Accordingly, Applicant requests withdrawal of the objection to the drawings.

Claims 9, 22, and 28 were objected to because of informalities. Applicant has amended these claims per the Examiner's suggestions. Accordingly, Applicant requests withdrawal of the objection to claims 9, 22, and 28.

The Examiner rejected claims 7 and 25-27 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Regarding claims 7 and 25, Applicant respectfully disagrees. The Examiner stated that the step of determining the flip angle such that the fat magnetization is at or near a null point is not clearly disclosed. *See Office Action, 05/16/07, pg. 4.* However, the Specification states that "[a]fter the zero-filling, a SPECIAL inversion pulse 82 with a 100 degree fat suppression pulse to magnetize fat within the ROI or

VOI is applied based on the relaxation time of fat to its null point 84.” *Paragraph [0031]*. The Specification further states that “[t]he flip angle of the SPECIAL inversion pulse 82 is automatically adjusted such that magnetization of fat within the ROI or VOI is at or near a null point at the filling of the center of k-space 78.” *Paragraph [0032]*. Applicant believes that that described in the Specification reasonably conveys to one skilled in the art that the inventors had possession of the subject matter of claims 7 and 25 at the time the application was filed.

With respect to claims 26 and 27, Applicant has amended claims 26 and 27 to clarify the functional relationship between flip angle and encoding scheme.

Accordingly, in light of at least the foregoing, Applicant requests withdrawal of the rejection of claims 7 and 25-27 under 35 U.S.C. §112, first paragraph.

The Examiner rejected claims 3, 21 and 25 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

With respect to claim 3, Applicant respectfully disagrees. As described in the Specification with regard to Figure 3, fat magnetization reaches of fully recovered state 87 that occurs when the fat magnetization passes a threshold point 89. *See paragraph [0031]*. Claim 3 particularly calls for filling each phase encoding view of k-space with full-fat-recovery-free MR data. That is, phase encoding view of k-space is filled with MR data that is free of full fat recovery data, i.e., filled with fat suppressed data.

With respect to claim 21, Applicant has amended claim 21 to call for reconstruction of a fully fat-suppressed medical image from the MR data. As explained above, fat magnetization is deemed to have fully recovered when it crosses the threshold point 89. Accordingly, the image as called for in claim 21 is a fully fat-suppressed image.

With respect to claim 25, Applicant respectfully disagrees. The Examiner stated that the adjective “automatically” is vague and indefinite. MPEP §2173.02 states that “[i]f upon review of a claim in its entirety, the examiner concludes that a rejection under 35 U.S.C. 112, second paragraph, is appropriate, such a rejection should be made and an analysis as to why the phrase(s) used in the claim is ‘vague and indefinite’ should be included in the Office action.” However, there is no “analysis” in the record as to why the Examiner concludes that “automatically” is vague and indefinite. Instead of being caused to determine the flip angle because of an action dependent upon, for example, an external stimulus, the computer is caused to determine the flip angle independent of external influence or control. Applicant requests clarification as to why the Examiner believes that automatic determination of the flip angle is vague and indefinite.

Accordingly, in light of at least the foregoing, Applicant requests withdrawal of the rejection of claims 3, 21 and 25 under 35 U.S.C. §112, second paragraph.

The Examiner rejected claim 1 under 35 U.S.C. §102(b) as being anticipated by Ma. Applicant has amended claim 1 to incorporate the subject matter of claim 14. Claim 14 has been canceled. While the Examiner rejected claim 14 under 35 U.S.C. §103(a) as being unpatentable over Ma in view of Bellemann, Applicant respectfully disagrees.

Amended claim 1 calls for, in part, acquiring MR data from the ROI prior to full fat recovery with a 3D fast gradient echo sequence (FGRE). The Examiner stated that Ma “discloses using a fat suppression pulse to suppress signals from fat in an MR image (STIR technique, column 1, lines 18-37).” *Office Action*, 05/16/07, pg. 5. With regard to the subject matter of acquiring MR data with a 3D fast gradient echo sequence (FGRE), the Examiner stated that “Bellemann discloses using a fast gradient echo sequence (see abstract).” *Id.* at 15. However, the Examiner has not identified or shown where the art of record discloses using a 3D fast gradient echo sequence. Neither Ma nor Bellemann teach or suggest three-dimensional imaging.

Accordingly, the Examiner has not satisfied the burden to show that in the art of record teaches each and every element of claim 1 and, therefore, has not satisfied the burden to show a *prima facie* case of obviousness. Accordingly, Applicant requests withdrawal of the rejections of claim 1 and the claims depending therefrom.

A Examiner rejected claims 18 and 23 under 35 U.S.C. §103(a) as being unpatentable over Ma in view of Haacke. However, the Examiner has again failed to satisfy the burden to show a *prima facie* case of obviousness thereof.

Specifically, claims 18 and 23 call for, in part, zero filling a portion of k-space in the slice direction. In the rejections of claim 18 and 23, the Examiner stated that Ma discloses “zero-filling of at least a portion of k-space (column 5, lines 13-41)” *Id.* at 11, 13. However, the Examiner has not shown where the art of record teaches or suggests zero-filling of at least a portion of k-space in the slice direction. Ma discloses that a full resolution image may be constructed “from the low-resolution data at 50 after zero-filling.” *Col. 5, Ins. 28-30*. However, the Examiner has not shown where Ma discloses that the zero-filling occurs in the slice direction.

Additionally, Applicant notes that the Examiner failed to reject claim 27. Instead, the Examiner only rejected claims 2-10, 13, 15, and 17-26 under 35 U.S.C. §103(a) as being unpatentable over Ma in view of Haacke.

Accordingly, the Examiner has not satisfied the burden to show that in the art of record teaches each and every element of claims 18 and 23 or the claims that depend therefrom.

Therefore, the Examiner has not satisfied the burden to show a *prima facie* case of obviousness. Accordingly, Applicant requests withdrawal of the rejections of claim 18, 23, and the claims depending therefrom.

The Examiner rejected claim 28 under 35 U.S.C. §102(b) as being anticipated by Kassai. Applicant has amended claim 28 to call for, in part, means for fastly acquiring 3D MR data only when fat magnetization is suppressed below a full-recovery threshold during breathhold moments. Kassai fails to teach, disclose or suggest the means called for in claim 28. Accordingly, Applicant requests withdrawal of the rejection of claim 28.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1-9, 11-13, and 15-28.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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Dated: August 16, 2007
Attorney Docket No.: GEMS8081.224

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General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 07-0845. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 07-0845. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 07-0845. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 07-0845.

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